

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) In a computer system using an operating system to provide access to hardware resources, wherein said operating system provides access to said hardware resources via a first code component, a method of replacing said first code component with a new code component while said operating system remains active and while said operating system provides continual availability to the hardware resources by applications operational in the computer system, and while said application call to said first component to perform defined functions, the method comprising using the computer system for:

instantiating an instance of a new code component to replace said first code component;

instantiating a mediator object;

initiating a swapping operation;

for the duration of the swapping operation, using the mediator object to intercept calls from the applications requesting the first code components to perform the defined functions, and using the mediator object to perform the requested functions;

establishing a quiescent state for the first code component;

transferring state from the first code component to the new code component; and

swapping the new code component for the first code component including the steps of:

identifying references to said first code component;

replacing the identified references to said first code component with references to said new code component; and

deallocating the first code component.

2. (Original) A method according to Claim 1, wherein the method is implemented transparently to said applications.

3. (Original) A method according to Claim 1, wherein the method is scalable.

4. (Previously Presented) A method according to Claim 1, wherein said computer system comprises a multiprocessor system, which comprises a plurality of processors, and said method is implemented across each of said processors independently.

5. (Previously Presented) A method according to Claim 1, wherein the replacing step includes the steps of:

transferring said identified references at said established quiescent state from the first code component to the new code component; and

after transferring said identified references to the new code segment at said established quiescent state, swapping the first code component with the new code component.

6. (Previously Presented) A method according to Claim 1, wherein the step of identifying references includes the steps of:

separating the first code component into objects; and

grouping said objects into a table, and arranging said table to identify said references to said objects, which identified references to said objects are entered in the table.

7. (Previously Presented) A method according to Claim 1, wherein:

the establishing step includes the step of:

establishing a quiescent state for the first code component, without locking the first code component, by tracking active threads to the first code component, and identifying the active threads as said identified references; and

the replacing step includes the steps of:

transferring said identified references, during the quiescent state, from the first code component to the new code component; and

after transferring said identified references, swapping the first code component with the new code component.

8. (Previously Presented) A method according to Claim 1, wherein the replacing step includes the steps of:

establishing a quiescent state for the first code component that includes the identified references;

transferring the identified references at the quiescent state from the first code component to the new code component by providing an infrastructure that operates to negotiate a best transfer algorithm; and

after transferring said identified references at the quiescent state, swapping the first code component with the new code component.

9. (Previously Presented) A method according to Claim 1, wherein:

the step of identifying references includes the steps of

separating the first code component into objects, and

grouping said objects into a table, and arranging said table to identify said references to said objects, which identified references to said objects are entered in the table; and

the replacing step includes the steps of

establishing a quiescent state for the first code component that includes said identified references;

transferring said references identified to said objects for the first code component to the new code component by providing an infrastructure to negotiate a best transfer algorithm; and

after transferring said references to the new code segment, swapping the first code component with the new code component.

10. (Currently Amended) A system for swapping ~~[[source]]~~ code in a computer system including an operating system, said operating system including at least one code component and providing continual availability of hardware resources by applications operational in the computer system, the system comprising one or more processing units configured for:

~~means for~~ instantiating an instance of a new source code component to replace said ~~[[first]]~~ at least one code component;

instantiating a mediator object;

initiating a swapping operation;

for the duration of the swapping operation, using the mediator object to intercept calls from the applications requesting the first code components to perform the defined functions, and using the mediator object to perform the requested functions;

establishing a quiescent state for the ~~first source~~ at least one code component; transferring state from the ~~first source~~ at least one code component to the new source code component; and swapping the new source code component for the ~~first source~~ at least one code component, including:

~~means for~~ identifying, while said operating system is active and providing continual access to said resources, references to a ~~first source~~ the at least one code component of the operating system; and

~~means for~~ transferring the identified references to the new source code component, while said operating system is active and providing continual access to said resources, and then executing the swapping.

11. (Original) A system according to Claim 10, wherein the system operates transparently to said applications and the system is scalable.

12. (Previously Presented) A system according to Claim 10, wherein said computer system comprises a multiprocessor system, which comprises a plurality of processors, and said method is implemented across each of said processors independently.

13. (Currently Amended) A system according to Claim 10, wherein the ~~means for replacing step includes~~ transferring is done by:

~~means for~~ transferring said references at the established quiescent state from the ~~[[first]]~~ at least one code component to the new code component; and

means for swapping the ~~[[first]]~~ at least one code component with the new code component after said identified references have been transferred.

14. (Currently Amended) A system according to Claim 10, wherein the ~~means for~~ identifying references ~~includes~~ is done by:

~~means for~~ separating the ~~[[first]]~~ at least one code component into objects; and

~~means for~~ grouping said objects into a table, and arranging said table to identify said references to said objects, which identified references to said objects are entered in the table.

15. (Currently Amended) A system according to Claim 10, wherein the ~~means for~~ replacing ~~includes~~ transferring is done by:

~~means for~~ establishing a quiescent state for the ~~[[first]]~~ at least one code component, without locking the ~~[[first]]~~ at least one code component, by tracking active threads to the ~~[[first]]~~ at least one code component, and identifying the active threads as said identified references;

~~means for~~ transferring said identified references, during the quiescent state, from the ~~[[first]]~~ at least one code component to the new code component; and

~~means for~~ swapping the ~~[[first]]~~ at least one code component with the new code component after said identified quiescent state references have been transferred.

16. (Currently Amended) A system according to Claim 10, wherein the ~~means for~~ replacing ~~includes~~ transferring is done by:

~~means for~~ establishing a quiescent state for the ~~[[first]]~~ at least one code component that includes the identified references;

~~means for~~ transferring the identified references, during the quiescent state, from the ~~[[first]]~~ at least one code component to the new code component by providing an infrastructure to negotiate a best transfer algorithm; and

~~means for~~ swapping the ~~[[first]]~~ at least one code component with the new code component after said identified references have been transferred.

17. (Currently Amended) A system according to Claim 10, wherein:
the ~~means for~~ identifying references ~~includes~~ is done by:

i) ~~means for~~ separating the ~~[[first]]~~ at least one code component into objects,
and

ii) ~~means for~~ grouping said objects into a table, and arranging said table to identify said references to said objects, which identified references to said objects are entered in the table; and

the means for replacing includes transferring is done by:

- i) ~~means for~~ establishing a quiescent state for the [[first]] at least one code component;
- ii) ~~means for~~ transferring the identified references during the quiescent state, from the [[first]] at least one code component to the new code component by providing an infrastructure to negotiate a best transfer algorithm; and
- iii) ~~means for~~ swapping the [[first]] at least one code component with the new code component after said identified references have been transferred.

18. (Currently Amended) A program storage device, for use with a computer system including an operating system to provide access to hardware resources, wherein said operating system provides access to said resources via a first code component, said program storage device being readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for replacing said first code component with a new code component while said operating system remains active and while said operating system provides continual availability to said resources by applications operational in the computer system, and while said applications call to said first component to perform defined functions, the method steps comprising:

instantiating an instance of a new code component to replace said first code component;

instantiating a mediator object;

initiating a swapping operation;

for the duration of the swapping operation, using the mediator object to intercept calls from the applications requesting the first code components to perform the defined functions, and using the mediator object to perform the requested functions;

establishing a quiescent state for the first code component;

transferring state from the first code component to the new code component; and

swapping the new code component for the first code component including the steps of:

identifying references to said first code component;

replacing the identified references to said first code component with references to said new code component; and

deallocating the first code component.

19. (Previously Presented) A program storage device according to Claim 18, wherein the method is implemented transparently to said applications, the method is scalable, and said computer system comprises a multiprocessor system, which comprises a plurality of processors, and said method is implemented across each of said processors independently.

20. (Previously Presented) A program storage device according to Claim 18, wherein the replacing step includes the steps of:

establishing a quiescent state for the first code component;

transferring said identified resources at said established quiescent state from the first code component to the new code component; and

after transferring said identified references to the new code segment at said established quiescent state, swapping the first code component with the new code component.

21. (Previously Presented) A program storage device according to Claim 18, wherein the step of identifying references includes the steps of:

separating the first code component into objects; and

grouping said objects into a table, and arranging said table to identify said references to said objects, which identified references to said objects are entered in the table.

22. (Previously Presented) A program storage device according to Claim 18, wherein the replacing step includes the steps of:

establishing a quiescent state for the first code component, without locking the first code component, by tracking active threads to the first code component, and identifying the active threads as said identified references;

transferring said identified references, during the quiescent state, from the first code component to the new code component; and

after transferring said identified references, swapping the first code component with the new code component.

23. (Previously Presented) A program storage device according to Claim 18, wherein the replacing step includes the steps of:

transferring the identified references at the quiescent state from the first code component to the new code component by providing an infrastructure that operates to negotiate a best transfer algorithm; and

after transferring the identified at said quiescent state, swapping the first code component with the new code component.

24. (Previously Presented) A program storage device according to Claim 18, wherein: the step of identifying references includes the steps of

- i) separating the first code component into objects, and
- ii) grouping said objects into a table, and arranging said table to identify references to said objects, which are entered in the table; and

the replacing step includes the steps of

- i) establishing a quiescent state for the first code component that includes said identified references;

- ii) transferring said references identified to said objects for the first code component to the new code component by providing an infrastructure to negotiate a best transfer algorithm; and

- iii) after transferring said identified references, swapping the first code component with the new code component.